

ABSTRACT OF THE DISCLOSURE

A cross stack rapid transition protocol is provided for permitting multiple network devices organized as a stack to rapidly transition their ports in response to network changes so as to minimize traffic flow disruptions while avoiding loops. Each switch in the stack has a stack port that connects the switch to another switch in the stack, and a plurality of ports for connecting the switch to other entities of the computer network. Each switch includes a Spanning Tree Protocol (STP) entity that transitions the ports of the switch among a plurality of states including a forwarding state and a blocking state. Each switch also tracks which other switches are members of the switch stack. The stack port of each switch is transitioned to the forwarding state, and a single switch having connectivity to a root is elected to be a Stack Root. One or more other switches may have Alternate Stack Root Ports, that provide alternate paths to the root. If the current Stack Root loses connectivity to the root, the switch whose Alternate Stack Root Port represents the next best path to the root issues one or more proposal messages to the other members of the switch stack. These other members respond with an Acknowledgement, and the former Stack Root transitions its port to the blocking state. Once the proposing switch receives an Acknowledgment from all other active members of the switch stack, it transitions its Alternate Stack Root Port to the forwarding state so that network messages can be forwarded to and from switch stack.